factor VII deficiency

Factor VII deficiency is a rare bleeding disorder that varies in severity among affected individuals. The signs and symptoms of this condition can begin at any age, although the most severe cases are apparent in infancy. However, up to one-third of people with factor VII deficiency never have any bleeding problems. Factor VII deficiency commonly causes nosebleeds (epistaxis), bleeding of the gums, easy bruising, and prolonged or excessive bleeding following surgery or physical injury. Bleeding into joint spaces (hemarthrosis) and blood in the urine (hematuria) occasionally occur. Many women with factor VII deficiency have heavy or prolonged menstrual bleeding (menorrhagia). Severely affected individuals have an increased risk of bleeding inside the skull (intracranial hemorrhage) or in the gastrointestinal tract, which can be life-threatening. Although factor VII deficiency is primarily associated with increased bleeding, some people with the condition have excessive blood clotting (thrombosis).

Frequency

Factor VII deficiency is estimated to affect 1 in 300,000 to 1 in 500,000 people. It is the most frequently occurring of a group of disorders classified as rare bleeding disorders.

Genetic Changes

The inherited form of factor VII deficiency, known as congenital factor VII deficiency, is caused by mutations in the *F7* gene, which provides instructions for making a protein called coagulation factor VII. This protein plays a critical role in the coagulation system, which is a series of chemical reactions that forms blood clots in response to injury. These mutations reduce the amount of coagulation factor VII in the bloodstream. Such a reduction prevents blood from clotting normally, causing episodes of excessive bleeding. It is not known why some people with this condition have problems with thrombosis. Researchers are also do not know what determines the severity of the condition; it does not appear to be related to the amount of coagulation factor VII in the bloodstream.

The noninherited form of the disorder, called acquired factor VII deficiency, is less common than the congenital form. It can be caused by liver disease or by blood cell disorders such as myeloma or aplastic anemia. Acquired factor VII deficiency can also be caused by certain drugs such as medicines that prevent clotting, or by a deficiency of vitamin K.

Inheritance Pattern

Congenital factor VII deficiency is inherited in an autosomal recessive pattern, which means both copies of the *F7* gene in each cell have mutations. The parents of an individual with an autosomal recessive condition each carry one copy of the mutated gene, but they typically do not show signs and symptoms of the condition.

Acquired factor VII deficiency is not inherited.

Other Names for This Condition

- F7 deficiency
- hypoproconvertinemia
- proconvertin deficiency
- prothrombin conversion accelerator deficiency
- serum prothrombin conversion accelerator deficiency

Diagnosis & Management

Genetic Testing

- Genetic Testing Registry: Factor VII deficiency
  https://www.ncbi.nlm.nih.gov/gtr/conditions/C0015503/

Other Diagnosis and Management Resources

- MedlinePlus Encyclopedia: Factor VII Deficiency
  https://medlineplus.gov/ency/article/000548.htm
- World Federation of Hemophilia: Treatment Options
  https://www.wfh.org/en/sslpage.aspx?pid=668

General Information from MedlinePlus

- Diagnostic Tests
  https://medlineplus.gov/diagnostictests.html
- Drug Therapy
  https://medlineplus.gov/drugtherapy.html
- Genetic Counseling
  https://medlineplus.gov/geneticcounseling.html
- Palliative Care
  https://medlineplus.gov/palliativecare.html
- Surgery and Rehabilitation
  https://medlineplus.gov/surgeryandrehabilitation.html

Additional Information & Resources

MedlinePlus

- Encyclopedia: Bleeding Into the Skin
  https://medlineplus.gov/ency/article/003235.htm
- Encyclopedia: Blood Clot Formation
  https://medlineplus.gov/ency/imagepages/19462.htm
- Encyclopedia: Factor VII Deficiency
  https://medlineplus.gov/ency/article/000548.htm
- Encyclopedia: Gastrointestinal Bleeding
  https://medlineplus.gov/ency/article/003133.htm
- Health Topic: Bleeding Disorders
  https://medlineplus.gov/bleedingdisorders.html

Genetic and Rare Diseases Information Center

- Factor VII deficiency
  https://rarediseases.info.nih.gov/diseases/2238/factor-vii-deficiency

Educational Resources

- Disease InfoSearch: Factor VII Deficiency
  http://www.diseaseinfosearch.org/Factor+VII+Deficiency/2711
- MalaCards: factor vii deficiency
  http://www.malacards.org/card/factor_vii_deficiency
- Merck Manual Consumer Version: How Blood Clots
  http://www.merckmanuals.com/home/blood-disorders/blood-clotting-process/how-blood-clots
- Orphanet: Congenital factor VII deficiency
  http://www.orpha.net/consor/cgi-bin/OC_Exp.php?Lng=EN&Expert=327
- Womenshealth.gov: Bleeding Disorders Fact Sheet
  https://www.womenshealth.gov/publications/our-publications/fact-sheet/bleeding-disorders.html

Patient Support and Advocacy Resources

- Canadian Hemophilia Society
  http://www.hemophilia.ca/en/bleeding-disorders/other-factor-deficiencies/factor-vii-deficiency/
- Foundation for Women and Girls with Blood Disorders
  http://www.fwgbd.org/

- National Hemophilia Foundation
  https://www.hemophilia.org/Bleeding-Disorders/Types-of-Bleeding-Disorders/Other-Factor-Deficiencies/Factor-VII
- National Organization for Rare Disorders (NORD)
  https://rarediseases.org/rare-diseases/factor-vii-deficiency/
- World Federation of Hemophilia
  https://www.wfh.org/en/sslpage.aspx?pid=665

ClinicalTrials.gov

- ClinicalTrials.gov
  https://clinicaltrials.gov/ct2/results?cond=%22factor+VII+deficiency%22

Scientific Articles on PubMed

- PubMed
  https://www.ncbi.nlm.nih.gov/pubmed?term=%28Factor+VII+Deficiency%5BMAJR%5D%29+AND+%28factor+VII+deficiency%5BTIAB%5D%29+AND+english%5Bla%5D+AND+human%5Bmh%5D+AND+%22last+1440+days%22%5Bdp%5D

OMIM

- FACTOR VII DEFICIENCY
  http://omim.org/entry/227500

Sources for This Summary

- Girolami A, Santarossa C, Cosi E, Ferrari S, Lombardi AM. Acquired Isolated FVII Deficiency: An Underestimated and Potentially Important Laboratory Finding. Clin Appl Thromb Hemost. 2015 Aug 31. pii: 1076029615599440. [Epub ahead of print]
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/26329909
- Herrmann FH, Wulff K, Auerswald G, Schulman S, Astermark J, Batorova A, Kreuz W, Pollmann H, Ruiz-Saez A, De Bosch N, Salazar-Sanchez L; Greifswald Factor FVII Deficiency Study Group. Factor VII deficiency: clinical manifestation of 717 subjects from Europe and Latin America with mutations in the factor 7 gene. Haemophilia. 2009 Jan;15(1):267-80. doi: 10.1111/j.1365-2516.2008.01910.x. Epub 2008 Oct 30.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/18976247
- Mariani G, Bernardi F. Factor VII Deficiency. Semin Thromb Hemost. 2009 Jun;35(4):400-6. doi: 10.1055/s-0029-1225762. Epub 2009 Jul 13. Review.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/19598068

- Mariani G, Herrmann FH, Bernardi F, Schved JF, Auerswald G, Ingerslev J. Clinical manifestations, management, and molecular genetics in congenital factor VII deficiency: the International Registry on Congenital Factor VII Deficiency (IRF7). Blood. 2000 Jul 1;96(1):374.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/10939805
- Mariani G, Herrmann FH, Dolce A, Batorova A, Etro D, Peyvandi F, Wulff K, Schved JF, Auerswald G, Ingerslev J, Bernardi F; International Factor VII Deficiency Study Group. Clinical phenotypes and factor VII genotype in congenital factor VII deficiency. Thromb Haemost. 2005 Mar;93(3):481-7.
  Citation on PubMed: https://www.ncbi.nlm.nih.gov/pubmed/15735798

Reprinted from Genetics Home Reference:
https://ghr.nlm.nih.gov/condition/factor-vii-deficiency

Reviewed: October 2016
Published: March 21, 2017

Lister Hill National Center for Biomedical Communications
U.S. National Library of Medicine
National Institutes of Health
Department of Health & Human Services